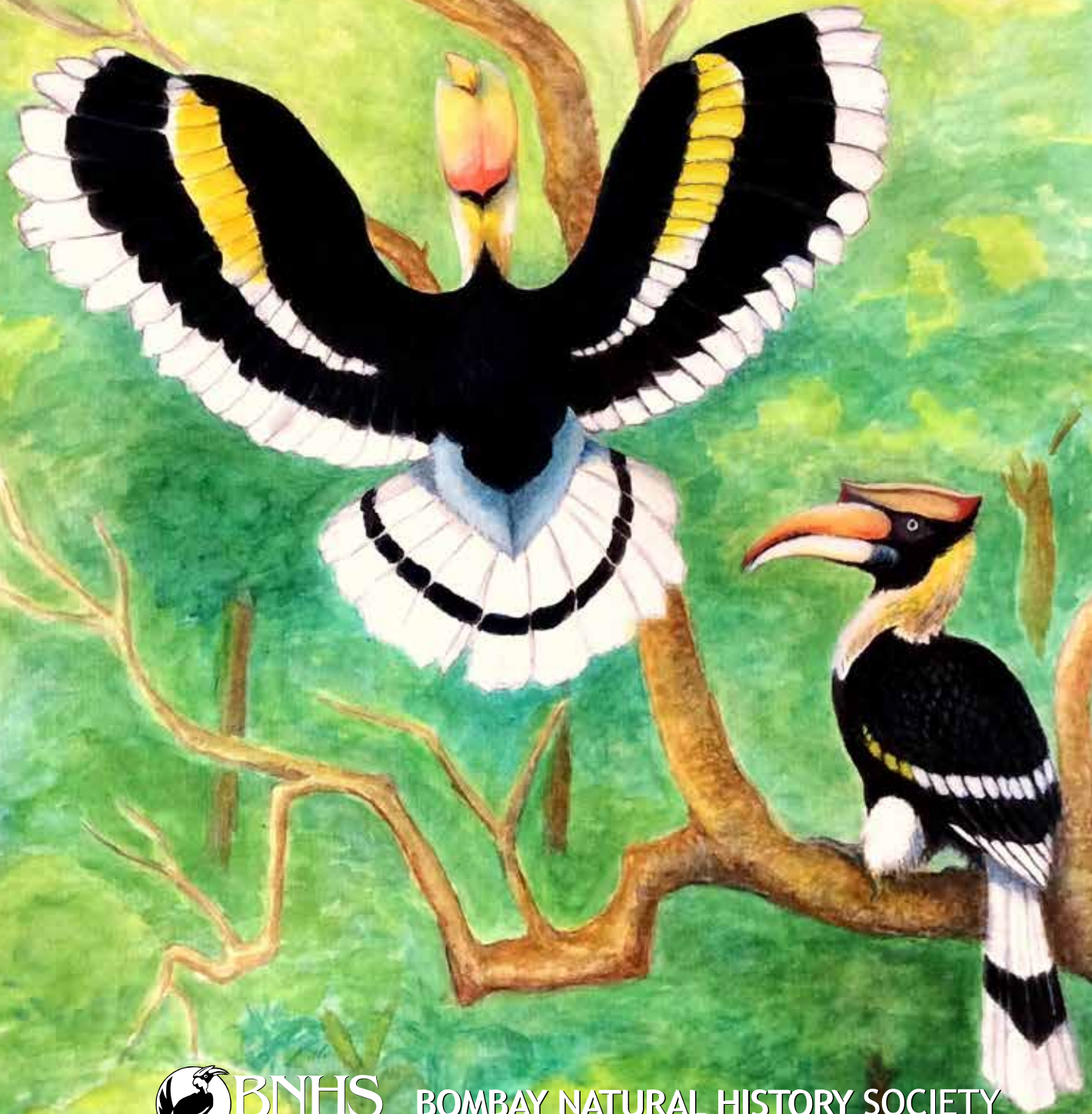


# HORNBILL

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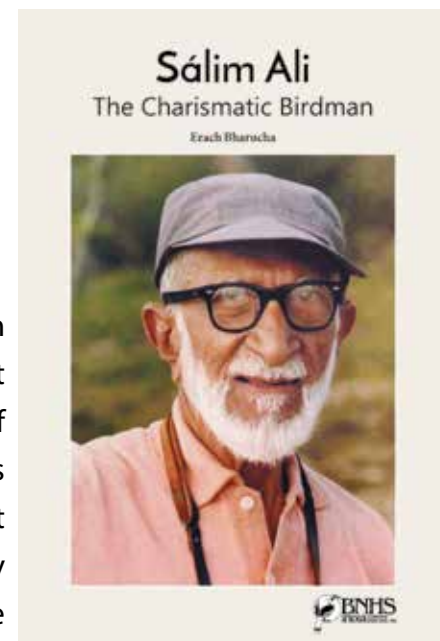


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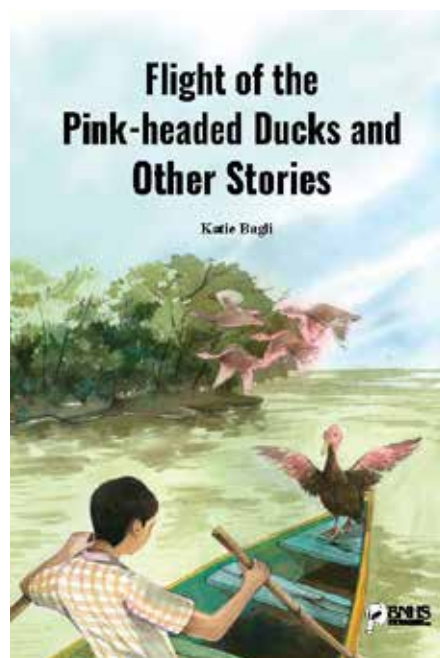


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requirements, among other things,  
a crucial prerequisite for focused  
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Rajaji, the lesser-known  
cousin of Corbett

Situated on the foothills of  
the Himalayan range,  
Rajaji National Park is an  
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## Editorial...

We are pleased to inform readers that with this issue of the *Hornbill*, we will be reverting to publishing four issues of the print copy each year. There was a slight delay in bringing out the current issue; however, we will strive to restore the magazine's periodicity of publication and dispatch schedule to that of the pre-pandemic days.

The front cover of this issue has been illustrated by Mr Ajai Saxena, an accomplished forester and a wildlifer *par excellence*. Before joining the Indian Forest Service, he had worked with the BNHS in the 1980s. We are glad that Mr Saxena decided to share his watercolour painting of the Great Hornbill with us and look forward to receiving such creative contributions from our esteemed members.

For the past one year, I have been travelling extensively in the Thar Desert. The roads in the Thar are well maintained and deliver a joyful ride to us, but they have become death traps for wildlife inhabiting this area. Roadkills of Hedgehog, Spiny-tailed Lizard, Bengal Monitor Lizard, Desert Fox, Chinkara, and a multitude of bird species are a common sight anywhere on the roads in the Thar. While safe keeping of our international borders needs good road connectivity, a good understanding of wildlife mortality hotspots along roads is also important to prevent such needless deaths. Designing a wildlife friendly linear infrastructure in a forest habitat is far easier than in a desert landscape, where the habitat looks more uniform and empty. Therefore, a critical understanding of roadkill hotspots is an absolute necessity for designing mitigation strategies.

One of the articles published in the current issue deals with my favourite protected area in India, Rajaji Tiger Reserve (RTR). Named after the last Governor-General of independent India – Sri C. Rajagopalachari – RTR has personally been a tremendous source of inspiration for me. A voluntary relocation of the Gujjar settlements from the area in early 2000s has completely transformed the wilderness of Rajaji for the better. I have had the privilege of monitoring the recovery of this wilderness for 17 continuous years. Spaces like Rajaji aptly demonstrate the resilience of nature; left to itself, the place bounced back within no time, immediately after the relocation of the human settlements.

There are very few successful conservation breeding programmes in India. The Pygmy Hog breeding programme led by Dr Goutam Narayan – a former BNHS scientist – is one such remarkable success story. Pygmy Hogs are bred in captivity and are being released in wildlife sanctuaries to increase wild populations and to ensure

their survival. In this issue, the brilliant image of Pygmy Hog from Orang National Park by BNHS scientist Dr Biswajit Chakdar features two such animals released in the wild. The Pygmy Hog conservation breeding programme has undoubtedly brought the species back from the brink of extinction.

The issue also features interesting articles on life forms from the Deccan Plateau and semi-arid zones of the country. In another article, Leonard Rebello, a mechanical engineer by profession, has systematically documented the birds in his backyard.

BNHS has been in the forefront of the conservation movement in India and will continue to steer the movement through its research and interventions at the policy level. Ms Neha Sinha has been leading the policy cell of the BNHS and her recent interventions in the proposed amendments of Indian Wild Life (Protection) Act, 1972 and Biological Diversity Act, 2002 are praiseworthy. We look forward to receiving inputs regarding conservation issues from our members, as well as other citizens of the country to continue our efforts in saving India's wilderness.

**Bivash Pandav**





# THE STORY OF AN UNPRETENTIOUS, SPINY NEIGHBOUR

Text: Brawin Kumar and Saravana Karuna Moorthy



Charismatic animals like the tiger or elephant are often the prime focus of conservation initiatives, while less enigmatic species are for the most part overlooked. Hedgehogs are among such exceedingly terra-incognito species. Hedgehogs are extant in parts of Europe and Asia, and of the 17 species of hedgehogs in the family Erinaceidae, India is home to three: South Indian Hedgehog *Paraechinus nudiventris*, Indian Hedgehog *Paraechinus micropus*, and Indian Long-eared Hedgehog *Hemiechinus collaris*.

The name 'hedgehog' came into use around the year 1450 from Middle English and refers to their nature of frequenting hedgerows (heyg/hegge = hedge) and the long pig-like snout (hoge/hogge = hog). Hedgehogs are small, stubby, nocturnal mammals with brown and white grooved quills on their back; unlike those of the porcupine, hedgehog spines are not easily detachable. When threatened, a hedgehog rolls its fur-clad face and abdomen into a ball of spines in self-defence.

Hedgehogs live in scrub, hedgerows, and grass patches in lowlands, dunes, foothills, hillocks, pasture lands, on the edges of agricultural fields, and even in urban areas that have turned into their chief foraging and nest building sites in some countries. Though they inhabit a broad assortment of habitats, most people are unlikely to have encountered hedgehogs, as these nocturnal mammals stay asleep in burrows all through the day, and leave

their nests only after dusk in search of food, travelling up to two kilometres each night. They have poor eyesight, but their profound sense of smell and acute hearing come in handy while foraging for food. Their omnivorous diet varies with habitat and season; beetles, caterpillars, earthworms, slugs, and snails being their favourite. A promiscuous species, the males habitually forgo parental care; they generally have home ranges twice the size as those of females. Females build nests mostly in shrubs and in grasslands with dry leaves, grasses, and twigs. They have a litter of four to six, and usually breed twice a year.

The South Indian Hedgehog (also known as Madras Hedgehog or Bare-bellied Hedgehog) is found in Tamil Nadu (its vernacular name *mulleli* translates to thorn-mouse!), Kerala, and Andhra Pradesh. Scientific literature indicates its occurrence in isolated patches in dry deciduous scrub with Acacia, rocky landscapes, and areas close to farmlands and villages. Such habitats have been shrinking due to increasing anthropogenic pressure from fuel wood collection, agriculture, logging, and urbanization. More than 13 species of hedgehogs, including Indian species, figure in the current global trade in wildlife. The lack of information on our hedgehog species would be an obstacle in formulating conservation plans for them.

## Bridging the knowledge gap

To help bridge the gap in knowledge on the South Indian Hedgehog, in 2013 we undertook

Hedgehogs often head for thorned and wooded areas, as this offers them adequate protection from predators







JUDE

When threatened, the hedgehog tucks its head, legs, and tail into a ball and erects its quills in a crisscross pattern, making its body round and spiky

a detailed study in Tamil Nadu to estimate its population, map the distribution, study its ecology, and identify the threats it faced, in order to formulate a conservation strategy for its long-term survival. We worked without financial support prior to receiving aid under the Ravi Sankaran Fellowship Programme in 2016.

Our first objective was to ascertain the occurrence sites of the species through field surveys and questionnaire interviews, museum visits in Madurai, Sivakasi, and Chennai to study specimens (skulls or skins), and refer to published information on the species from 2000 onwards, including newspaper reports. Field surveys were undertaken, during both day and night, in non-protected areas (mainly in villages, where typical hedgehog habitats exist) in Kanyakumari, Tirunelveli, Tuticorin (now Thoothukudi), Tenkasi, Virudhunagar, Dindigul, Ramanathapuram, Karur, Namakkal, Coimbatore, the Nilgiris, Salem, Erode, and Vilupuram districts. We interviewed a total of 917 local people living close to hedgehog habitats in Tiruppur, Erode, and Tirunelveli districts, which had sizeable records. We did not carry out surveys in protected areas due to the rarity of records of the species in protected areas, and since the typical habitat of hedgehogs is outside forests.

### Research Insights

Our study revealed some interesting findings. Other than sighting 18 individuals, we recorded evidence of their occurrence in dry land, sandy patches, and scrub dominated plains at 103 locations. This species was found to be adapted to different habitat types, including those in the vicinity of houses, water tanks, and roads, but their distribution was patchy, with more reports/records from Palmyra dominated landscapes. They were mostly observed living in burrows built by other animals such as pangolins, in fallen logs, and under tree roots in both the plains and mountains. More records of occurrence were obtained in the rocky areas and dry parts of Tirunelveli, Salem, Ramanathapuram, Megamalai, Tiruchirapalli, and Nilgiris, while earlier records were from the Avinashi, Perundurai, Chennai, Salem, and Coimbatore areas.

We analysed faecal pellet samples, which gave us insights into their diet. They seem to relish insects and plants. Locals reported that they feed on ants, beetles, earthworms, cockroaches, crickets, snails, slugs, centipedes, termites, grasshoppers, frogs, toads, snakes, bird eggs, carrion, and mushrooms. The Indian Fox, Golden Jackal, and Grey Mongoose are their main predators. There is a published report on the presence of the spines of South Indian Hedgehog in the scat of Indian



BRAVIN KUMAR

Predators find it difficult to attack this solid ball of spikes

Fox from Naanguneri (Tirunelveli district). Some locals claimed that raptors too prey on them. A questionnaire respondent in Sankarankovil (Tenkasi district) recounted a hedgehog being killed and eaten by an Indian Peafowl!

### Conservation Issues

Most of the former strongholds of South Indian Hedgehog have experienced tremendous and rapid loss due to expansion of agriculture and urbanization. In Tamil Nadu, the *theri* (sedimentary red soil) areas in the coastal plains of Tuticorin and Tirunelveli, the dry grasslands interspersed with agricultural fields (known as *Korangadu*) in Erode, Karur, and Coimbatore, and a few other pockets elsewhere in the state are the last remaining landscapes with viable populations. *Korangadu* lands have shrunk considerably due to large-scale shift to cotton, coconut, and mango cultivation. Moreover, with the increase in the road network, vehicular traffic, and fragmentation of habitats, hedgehogs have become highly prone to road hits. Hedgehogs abandon their burrows during rains and get attracted to the relative dryness and warmth of tarred roads. Our data indicates that over 1,500 hedgehogs were lost due to roadkills in the last three years.

Recovery of dried skins of hedgehogs from Tirunelveli, Tuticorin, and Erode districts indicate

poaching. Narikuruvaar (a nomadic hunting community) hunted and sold South Indian Hedgehogs for Rs 250–500 in the local markets. This species is known as *Irumaleli* (translates to “cough mouse”) in Papanasam (Tenkasi district), as a concoction of powdered burnt spines and honey is used in the treatment of asthma, tuberculosis, and whooping cough, apart from other ailments. R.C. Wroughton recorded the use of their flesh to treat whooping cough in Ramanathapuram district, as far back as 1907. People in Varasanadu valley (Theni district) kept them as pets and also ate their flesh. We recorded



SAMSON KIRUBAKARAN

Hedgehogs have become highly prone to road hits due to increase in vehicular traffic and fragmentation of habitats





BRAWIN KUMAR



BRAWIN KUMAR

The dried skin of the species are placed by the locals in their homes, in the superstitious belief that it will ward off evil spirits

similar use and practices from Tirunelveli district during the surveys. The dried skin of the species was sold at Rs 150–180, which the locals placed in their homes, in the superstitious belief that this would ward off evil spirits.

### The Way Forward

The South Indian Hedgehog is categorized under 'Least Concern' in the Red List by the International Union for Conservation of Nature (IUCN) due to their presumed abundance in their restricted ranges. They are not included in any schedule of the Wild Life (Protection) Act, 1972. This relatively low protection afforded in India, along with their isolated distribution, increasing loss and fragmentation of habitats, killing for body parts, and demand in the pet trade make them highly vulnerable to extinction.

It is imperative to initiate measures to conserve them in non-protected landscapes, as well as to heighten focus on the species in protected areas.



**R. Brawin Kumar** is a post-doctoral researcher at the Indian Institute of Science Education & Research (IISER), Tirupati. He works on the ecology and conservation of lesser-known small mammals in Asia.



**Saravana Karuna Moorthy** is a graduate student of ecology at Pondicherry University, and an amateur science writer inspired by the clout of orderly prose.

**Cover:** Great Hornbill by Ajai Saxena

Found in the Western Ghats, Himalayan foothills and the North-east, the Great Hornbill is a delight to watch and also photograph, especially while in flight. Ajai Saxena got such an opportunity in a deep valley between waves of forested hills at Dampa Tiger Reserve, Mizoram in January 2020, and this watercolour painting is a memory of that moment.

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# RAJAJI, THE LESSER-KNOWN COUSIN OF CORBETT

Text and Photographs: **Gangadharan Menon**



My wife Anita and I had been thirsting for months to go on a river trail, when BNHS announced its Wild Ganges trip in 2021 to a lesser-known tiger reserve named after Shri C. Rajagopalachari. I had first read of this park in Sunjoy Monga's WILDLIFE RESERVES OF INDIA and had waited 19 long years to be there.

The itinerary of the trip, designed by Dr Bivash Pandav who is now the Director of BNHS, was an absolute feast for any nature lover. The buffet included the semi-evergreen forests of Rajaji, the wetlands of Haiderpur, and the terai marshlands of Jhilmil Jheel Conservation Reserve. A two-hour drive took us through the temple towns of Rishikesh and Haridwar – the River Ganga descends here from the Himalaya.

Tigris Estate, where we stayed for all three nights, was one of the most well-appointed yet homely places I had ever stayed at in a forest. Owned and managed by Rajeev Mehta, it has the Tiger theme executed to the T with tiger emblems etched on glass and door handles, printed on cushions, rare photographs of tigers on the walls, tiger stripes on curtains, and pugmark replicas on teapots. Not surprising, as Rajeev was the Wildlife Warden of Rajaji National Park for many years, when he witnessed the happy proliferation of tigers from four to 37 in number. Even today, he continues to run an NGO named Eye of the Tiger. Another beautiful thing about this comfortable property is that it has no TV, no wi-fi, no cellphone network, no internet connectivity. One can truly cuddle into Mother

Nature's bosom here. In fact, Rajeev says with a twinkle in his eyes, "You can hear silence here."

Situated on the banks of Peeli River, nestled between the Shivalik Hills and the Middle Himalaya, Tigris Estate has three watch-towers strategically placed within its property, overlooking the river. Peeli, being a seasonal river, dries up by November and has only scattered puddles among the white pebbles that look like prehistoric eggs.

The first safari was in the evening to Jhilmil Jheel Reserve, an integral part of Rajaji NP. Our first sighting was of scores of Giant Wood Spider webs on both sides of the road. I wondered why a spider doesn't get stuck in its own web, to which Asif Khan, our group leader, replied, "The web is made up of two types of strands, some sticky and some non-sticky, and only the spider knows which is which!" On our way to the marshes, we saw the natural forest vegetation alternate with the exotic eucalyptus.

The jeep suddenly came to a halt under a watch-tower that loomed high above. The base of the tower was barricaded with barbed wire to prevent testosterone-charged tuskers from toppling it. Perched at a vantage point, we looked at the vast expanse of marshes where we saw a dozen Barasingha, like a vision rising from the mist.

When we drove along another part of the jheel, we saw two Ruddy Shelduck swimming in synchrony, reminding me of a story that I had heard about the species in Chilika. According to this tale, the shelduck was cursed by Lord Rama after Sita



► Indian Roller, our neighbour at Tigris

The fearless Chital ◀





A lone Himalayan Langur on the treetop

was abducted by Ravana. Rama and his brother were desperately looking for her in a forest. There Rama saw a pair of shelduck and asked them if they had seen his wife. The male shelduck mocked Rama for not knowing where his wife was. Seething with anger, Rama cursed the couple, “From now on, you both will be separated at night and be reunited only at dawn. Only then will you understand the pain of separation.”

When Imam, our guide, asked us if he should take a detour to see if the crocodiles were basking in the sun at their regular place, we said yes; unfortunately, they were missing that day. But we were more than compensated by the sighting of a Streak-throated Woodpecker that allowed us to capture stills in all possible angles.

The walk to the machan at Tigris after dinner, on a full moon night, was dreamy to say the least. After a long wait, during which our tired bodies were refreshed by *kullarhs* (clay cups) of lemon tea, the silence was pierced by the call of a Chital. It was then relayed across the Shivalik hills by small herds of Chital scattered on its slopes. Our powerful torches soon caught a pair of glistening eyes that stared towards us for a few minutes, before walking across the river and disappearing into the thick night. The local guide observed: ‘It must be a predator as the eyes are bluish-green:



A tigress had left her mark on the Tigris Estate ground

prey has reddish-orange eyes.’ Soon, we too retreated into our rooms and slipped under our blankets.

The next day, we were up by 5:00, and out by 6:00. As we drove to Rajaji’s Chilla Gate, we saw the sun peeping through an orange mist. The Asian Woollyneck reminded us to pull down our woollen caps a tad lower. The road that sliced Rajaji National Park had slit it cruelly into two unequal halves. Most of the wildlife exists in the larger half. While traversing the larger part of the forest, I spared a thought for the smaller one, which is now almost an island where animals are trapped as they cannot migrate to the other half, eventually leading to inbreeding. This is probably one of the reasons why there are more tigers in Corbett than in Rajaji.

Rajaji had just been opened to the public after the monsoon, which is a closed season in the Park. Possibly that, and the fact that the Park had been under an unprecedented lockdown for 18 months, explained the casual stroll of Chital, Sambar, and Wild Pig as they ambled across the road, unmindful of oncoming jeeps. On one tree was a pair of Oriental Pied Hornbill, while on another, we saw a Black-rumped Flameback knocking away on a dead branch of a dead tree, to start a new life – proving the old saying that



A photo-friendly Nilgai gave us the perfect pose



A five-year old tusker, half hidden among elephant grass





A Black Stork getting a bird's eye view



A pair of Oriental Pied Hornbill

nothing goes waste in the jungle. On two other adjacent trees were two Changeable Hawk-Eagles, unrecognizable as of the same species – one black and one white. But I reckon they were just living up to their name! This was indeed a birding bonanza, as in just three days we saw close to 100 of the 300 species that spread their wings in this region.

At the next turn was the highlight of the Rajaji trip – the sighting of a young five-year old tusker, his lower half hidden by elephant grass, with his family keeping a watchful eye on him, and making their presence felt by swaying the branches at regular intervals. The night ended with reliving the day's stories around a crackling bonfire.

The next day started with a long drive to Haiderpur, the largest wetland in Uttar Pradesh. This wetland is created by the backwaters of a barrage on the Ganga. First we visited a tiny patch of grassland where a rare and secretive bird lived with its small family of five: the Striated Grassbird. These birds stay hidden among the grasses, usually close to the ground, though they can perch higher. This was a huge patch of open grassland until just a couple of years ago, but sadly, it is dense with Narkul grass that is used for making houses. Give humans a use for anything, and they will ensure that it is wiped out in no time.

Then we walked to the riverbed of the mighty Ganga, which is reduced to a trickle by the barrage. There, for a nanosecond, Anita saw a Gangetic Dolphin before it dived back into the water without a trace. As part of the much-touted Namami Gange Project, boatmen were given motorboats on loan to take visitors downstream. We went for a boat ride to see the elusive Gharial. We did see one basking in the glory of the winter sun, but the holy trash on the river banks spoilt the view. Interestingly, what crores of rupees spent under the project couldn't do, the lockdown did in a few months: cleaning up of the Ganga. But sadly, all that good work was undone in a few days by the Kumbh Mela in April 2021, and the Ganga Snan the following October.

We proceeded to Haiderpur wetland where we met Ashish Loya, a loyal BNHS member, an avid birder and a passionate environmentalist. He explained that this important wetland is named after Haiderpur village that strangely doesn't exist

today. But thankfully, due to the diligent efforts of people like Ashish, Dr Asad R. Rahmani, ex Director, BNHS, and a host of committed forest officers, this wetland didn't become extinct like the village.

A three kilometre walk along a bund that was as straight as an arrow was extremely rewarding. There were watch-points at regular intervals, with benches to sit down and admire the view, and a cycle track to stop and stare. This wetland has over 300 bird species, including a hundred migrants. Ashish said the total bird count here would be around 50,000 in the peak season. Last year's bird count was very impressive: 15,000 Common Coot, 900 Common Pochard, 1,300 Ruddy Shelduck, 2,000 Ferruginous Duck, and over 2,000 Greylag Goose – making it the largest congregation of Greylag in the country.

After all this good news, Ashish shared some bad news. During the Kumbh Mela in Haridwar, anticipating a feast, thousands of macaques had descended on the temple town. And once the event got over, the authorities caught them in hordes and released them in unsuspecting villages nearby, from where they spread like wildfire. Haiderpur wetlands did not have a single macaque till April 2021, but now there are hundreds. The havoc they have caused here is



Streak-throated Woodpecker looking for food

unprecedented. In a spree of wanton destruction, they have raided and destroyed every single nest of every single owl species in Haiderpur. Another



Haiderpur wetland hosts the largest congregation of Greylag Goose in India





Participants with Asif Khan, the group leader

piece of bad news was the entry of the invasive aquatic Water Hyacinth that spreads like green cancer.

The last morning of the trip was a masterclass in identifying pugmarks. Right next to Tigris Estate, on the sandy riverbed, was a network of pugmarks. Rajeev said that the freshest among them was from last night, when two adult elephants and a calf had crossed over from Shivalik to Rajaji through their regular corridor adjoining the estate. A tiger had followed suit, and his pugmarks had intertwined with those of the elephants. The night before, a small herd of chital had crossed over, with a hyena close on their heels. And a few days before that, a lone leopard too had walked across. The impressions left behind by these pugmarks were so deep in our minds that we wanted to come back to this green paradise again, and again, and again. 🐾



**Gangadharan Menon** is a writer and wildlife photographer interested in everything that is there in a forest. He was felicitated by Sanctuary Asia in 2016 for his contribution in saving Silent Valley.

#### ABOUT THE POSTER

**Local Names:** Nal gahori (Assamese), Oma Thakri (Bodo)

The Critically Endangered Pygmy Hog *Porcula salvania*, smallest and rarest member of family Suidae in the world, is endemic to India. It is the only species under the genus *Porcula*. Once known from a few locations in northern West Bengal and north-western Assam, it is now restricted to a few sites in and around Manas National Park in Assam, with an estimated population of less than 200 individuals in the wild. Pygmy Hog is an indicator species; its presence reflects the health of its primary habitat, the tall, wet alluvial grasslands of the region.

Pygmy Hog measures 20–30 cm in height. It is sexually mature at one or two years old; the female gives birth to a litter of three to six piglets. It has a lifespan of about eight years. The adult makes a nest by digging a small furrow and lining it with grasses. During the heat of the day, it takes shelter in these nests. Its diet comprises roots, tubers, insects, rodents, and small reptiles.

The species is on the brink of extinction from loss and degradation of its grassland habitat, due to expansion of human settlements, encroachment for agriculture, indiscriminate burning of grass in the dry season, livestock overgrazing, and spread of invasive



Pygmy Hog *Porcula salvania*

alien plants. It is also hunted for meat by local tribes. Under the Pygmy Hog Conservation Programme, it is being successfully captive-bred and released into the wild. The reintroduction began in 2008, and till date 142 individuals have been released in Sonai-Rupai Wildlife Sanctuary (35 individuals), Orang National Park (59), Barnadi Wildlife Sanctuary (22), and Manas National Park (26). These reintroductions have presumably reversed its declining trend. However, much attention is still required to save this rare species and its threatened grassland habitat. ■

## Sunbird under an umbrella leaf



In August and September 2019, I regularly sighted a Purple Sunbird flying into a Common Fig *Ficus carica* tree in the evenings and roosting there. And with daybreak, it would duly fly off from the roosting tree. I assumed that the bird seen on all the occasions was the same individual since it roosted at the same spot, and also due to the streak on its throat, typifying a male in

eclipse plumage. This tree stands close to a street lamp in a bungalow near my residence in Satara, Maharashtra.

What was most interesting was that the bird chose its roosting spot under one of the leaves of the tree, the leaf acting like an umbrella above the sunbird. The bird, at one point, was recorded using the same leaf for six consecutive days. The leaf was distinct from the rest on the branch being the only large leaf, as the others had either withered away or were much smaller in size. The bird stopped visiting the tree when the tree had shed all the larger leaves, and those still standing were no longer big enough to act as an umbrella-like structure.

To my luck, the roosting spot under the leaf could be viewed clearly from the balcony of my house, which also permitted me to take a few photographs without much effort, which I am sure *Hornbill* readers will find captivating and may also be of value in our knowledge on the roosting behaviour of this dainty species. 📷

Dhairyasheel Dayal  
Satara, Maharashtra

## On glowworms and fireflies

“When evening closes nature’s eye,  
The glowworm lights her little spark  
To captivate her favourite fly,  
And tempt the rover through the dark.”

— James Montgomery

Monsoon nights can be so exciting. Once the rain stops, another world appears in the darkness. Listen hard and you can hear raindrops falling off leaves to the ground, and the chirruping of thousands of crickets. Frogs croak louder and louder till you wonder how such a small creature can make such a big noise. Among the shining leaves fallen on the ground you might see a soft glow. What can it be, you wonder, coming closer and closer to you, like a very tiny lantern moving in the dark. Look down carefully and do not step on it. It could be an immature glowworm on the prowl, hunting for a juicy snail. As soon as it finds one, it bites on the head of the snail and pulls so hard that the poor snail is drawn right out of its shell, and gobbled up in a minute.

The tail-end of the glowworm contains a special part that produces a soft greenish-white light. This is called bioluminescence, or light produced by a living thing. During the same time, you will also see bright lights moving around among the trees and bushes. They come

down on a branch a moment or two to rest, and fly off again. These are fireflies, males of the same insect, yet so different, as they have wings and can fly. They too have the same kind of light-producing part as the female, which helps them to attract the females. Each kind of firefly has a special pattern of light, which the female can recognize and know it is her own species. A scientist who studies these creatures can even make out changes in the temperature and humidity in the air by the changes in frequency of the firefly’s blinking light.

Fireflies are among the most beautiful insects of the night. In fields and on trees you can see swarms of them, all blinking away like so many stars in the sky, but even more exciting than stars, as you see them flitting about. Yet, if you see these insects during the day, you will hardly recognize them. The male firefly is a small brown beetle with a pair of shiny hard wings, and a second pair of wings that help it to fly, while the female glowworm has no wings at all. It is a matchstick-sized grub-like creature that crawls on the ground, and looks quite ordinary during the day. Did you ever think that darkness would help you to see better the beauty of these heavenly creatures? 📷

Gayatri W. Ugra  
Mumbai, Maharashtra



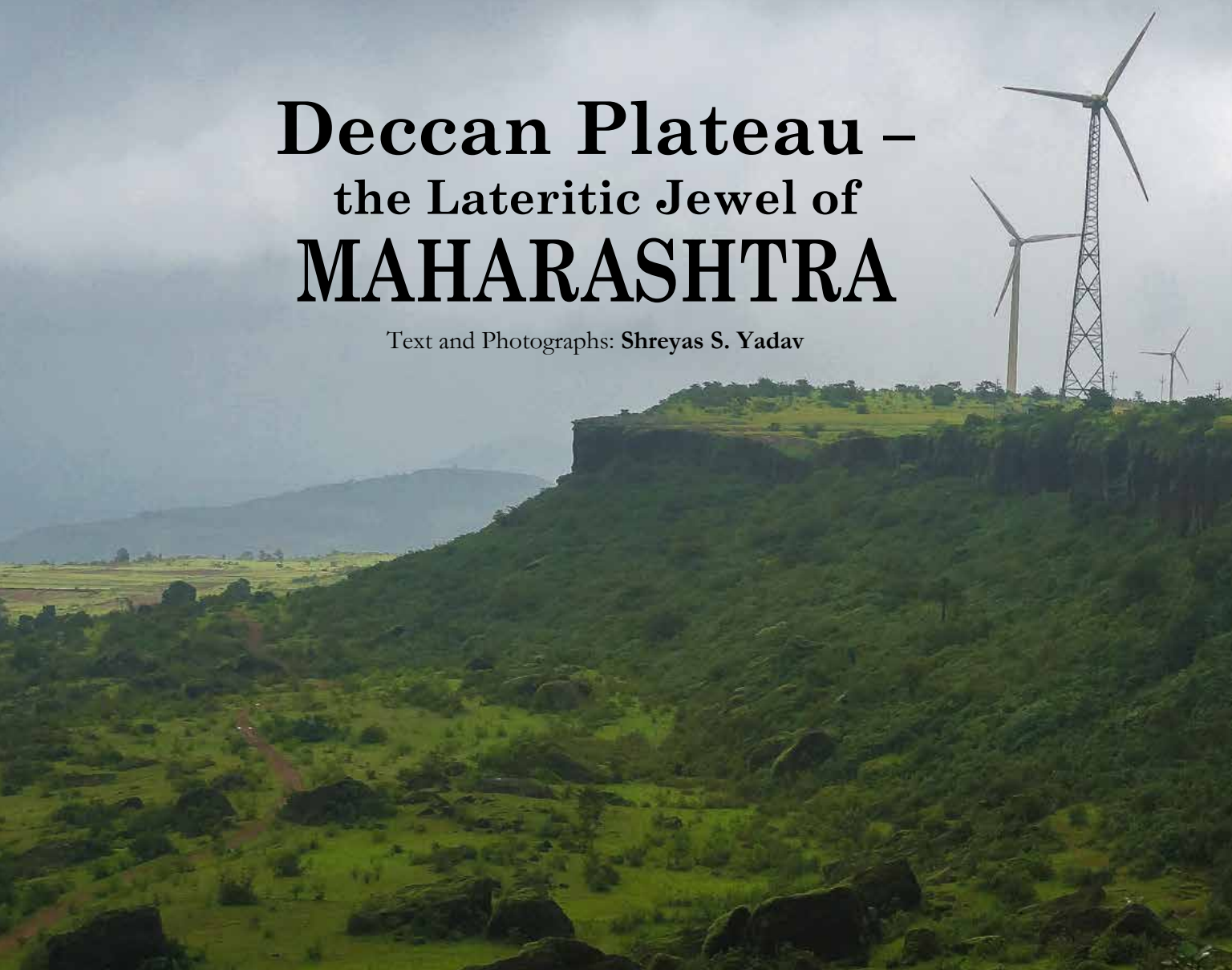
Pygmy Hog *Porcula salvania*





# Deccan Plateau – the Lateritic Jewel of MAHARASHTRA

Text and Photographs: Shreyas S. Yadav



*The Deccan Plateau is a triangular geographical entity located in the southern part of India, south of the Central Highlands and within the boundaries of the Western and Eastern Ghats. In Maharashtra, the Deccan Plateau lies to the east of the Western Ghats. This igneous-rock highland forms a unique ecosystem, bearing rare and endemic plants and animals.*

*The Deccan Plateau in Maharashtra experiences two acute and diverse seasons: a hot summer and an extremely wet monsoon. My intent here is to showcase the beauty of the Deccan Plateau in Maharashtra, and share my experiences in trekking and nature photography techniques. I hope these images will inspire nature lovers to go out and experience the magic of this unique ecosystem.*

The image above was taken in August, when there is a dramatic play of light, shadow, and rain. Golden light bathes the green grass and lateritic rocks in the foreground, and the dark monsoon clouds from the Arabian Sea form the background.

Green Energy: A balance between conservation and energy is an urgent need for humans! This picture presents a balanced co-existence between the ever-shrinking Western Ghats forests and the expanding energy needs of mankind. Gustly winds from the Arabian Sea voyaging through the

Ghats strike these windmills, which have been installed in many areas of the Deccan Plateau in Maharashtra.

I primarily used two tools: composition and HDR (High Dynamic Range image). Composition helped to place the forests in the foreground, the windmill in the centre and the howling monsoon clouds in the background. HDR helped to capture neutral, underexposed, and overexposed images. Merging the three images revealed details and colours from well-lit and dark shadow areas, and enhanced the details in the cloudy sky and green forest.



Reverse Waterfall

Reverse Waterfall: While driving uphill to reach the plateau, we came across tourists asking for the way to the Reverse Waterfall. Initially we chuckled, but after travelling ahead for another kilometre, we saw a board which actually gave directions to the “reverse” waterfall.

Streams on the flatland merge and descend rapidly across the borders of the Deccan Plateau, while roaring upward winds from the western valley propel this water upwards. The

opposing natural forces of wind and water create a beautiful “waterfall” but in the reverse direction.

I amplified the interaction of the agile waters and gusty winds by zooming (500 mm) at the point of interaction, using a telephoto zoom lens. Slowing down the shutter speed ( $< 1/60$  sec) helped to reveal the swiftness of water sprinkling over the basalt rock. I also wanted to control depth of field, and used manual exposure mode to control shutter speed and aperture.



*Eriocaulon tuberiferum*

*Eriocaulon tuberiferum*: An iconic species of the Deccan Plateau, this grows in lateritic soil and ponds. These flowers are endemic to the Western Ghats. On your next trip to Kaas, near Satara, do admire them. The flatland encompasses numerous ponds which sustain small ecosystems with beautiful plant

species such as *Eriocaulon*, *Aponogeton*, and *Utricularia*, algae, insects, crabs, frogs and snakes, among others.

I lay on the ground and used a wide angle lens to capture this beautiful but fragile ecosystem of lateritic rocks, the pond, and *Eriocaulon* in the foreground.





*Habenaria beyneana*

*Habenaria panchganensis*

*Habenaria beyneana* and *Habenaria panchganensis*: During August and September, the Deccan Plateau in Maharashtra gets covered with these beautiful ground orchids.

A telephoto zoom lens, control of lens aperture, composition, was all that I required to get these two images.



*Aponogeton satarensis*

Indian Blackbird

*Aponogeton satarensis*: In the early 1980s, a passionate young botany student, S.R. Yadav, while pursuing his PhD, found this plant in Mhavashi, Patan area of the Deccan Plateau. This plant grows in ponds on lateritic soil in a group; male and female plants are usually found in close proximity. Studies by botanists indicate that these plants depend on insects for pollination. These Y-shaped inflorescences are vibrantly coloured violet and pink.

Patience paid off: As I was scouting forest thickets through my camera lens, this myna caught my attention. On careful observation, I saw a chick sitting on an adjacent perch. I zoomed my lens to its full focal length (500 mm) and rested my camera gear for support. The distance between me and the bird was more than 15 m. Soon the parent myna caught a worm from the ground and came to feed the chick. I kept a respectful distance from the subject, did not use a flash, and left the place as early as possible – some guidelines one should follow, for ethical nature photography.



Eurasian Collared-dove



Wire-tailed Swallow



Malabar Lark

Avifauna: During August and September, avifauna comes alive on the plateau, as this is the season when food plants, seeds, insects, frogs, crabs, lizards, and snakes are available in plenty, providing a grand buffet for birds ranging from larks, doves, kites to eagles. Unlike summer, when everything is dry, the monsoon offers a great opportunity to capture these fabulously coloured birds in a lush green landscape under diffused sunlight, which acts as a natural photo studio.

I used aperture priority to control the depth of field and bokeh (i.e., blurred areas of the image). Instead of capturing the subject from a standing position, I prefer attaining eye-level with the bird, as this makes the composition and appearance of the image unique. Common elements for all the three images are the physical features of the bird, composition, eye-level perspective, and a blurred background contrasting with the colours of the bird.



Rat Snake

Rat Snake staring through the forest: For a brief moment, the sunrays pierced through the rainy clouds on the plateau, and suddenly, life started stirring everywhere. So was the case for this rat snake! I first sighted the snake entering into a bush, and waited to see if it would emerge. Indeed it did, about two metres from where I stood. I immediately clicked

the shutter release button. By the time I could take the next image, it had retreated, as swiftly as it appeared, into the forest.

The lush green of the bush contrasting with the warm colours of the snake make the snake's stare riveting and photogenic.

*I hope you have enjoyed this journey with me through the Deccan Plateau. Do spend at least one rainy day in this unique table-land of Maharashtra!* 🐍

**Shreyas S. Yadav** is an Engineer, wildlife and nature photographer, a writer and explorer. He shares his experience on digital post-processing and nature photography through his blog





# Praying Mantis in the Avatar of an Ant

Text and Photographs: **Dharmendra Khandal**

**H**ow do the nymphs of the praying mantis protect themselves against ants?

The praying mantis is a predatory insect that catches its prey with great dexterity using its raptorial forelegs, appearing almost as if it were doing so with disdain. But did you know that when it is young (in the nymphal stages), it is preyed upon by ants, one of the prey of adult mantids.

The Asian Ant Mantis *Odontomantis planiceps*, a species of praying mantis, is easy to spot as it is commonly found in our gardens. It completes its life cycle in three stages – egg, nymph, and adult. The eggs of the praying mantis are laid in a special egg case called ootheca, which is made up of a foam-like material produced by the mother during egg laying. The foam hardens on exposure to air to form the protective ootheca. Young praying mantids, called nymphs,



The young Asian Ant Mantis resemble the ants that prey on them



Asian Ant Mantis – adult

they live in a unique avatar – they look just like the ants themselves. At this stage, the whole body of the mantis is black like that of an ant (instead of green as in the adult). The deception goes even further, for the nymphs even move about like ants. This form of camouflage, known as Batesian mimicry, helps them to protect themselves against the predatory ants which inhabit the same spaces. After the fourth instar, the front legs of the mantid begin to turn green and gradually the whole body becomes green, and they turn into iconic expert hunters, which stay well camouflaged among green leaves. Quite an avatar, this mantid! 🐛

*All mantids do not exhibit this mimicry. They mainly use cryptic coloration for camouflage against predators as well as prey. – Eds*

emerge from the eggs under favourable climatic conditions. This is an extremely vulnerable stage for the insects, as they can easily be preyed upon by ants.

The growing young go through six nymphal stages, or instars. During the first three instars, they are small and weak, and ants can kill them with minimal effort. However, during this time



**Dharmendra Khandal** is a conservation biologist working with the Ranthambhore based NGO Tiger Watch since 2003.

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# Backyard Birding

Text and Photographs: Leonard Rebello

Paradise Flycatcher Male

Stepping out on the terrace of my house one cold winter morning, I was held spellbound by the sight unravelling before me. A bright golden-yellow bird was busy feasting on a huge caterpillar it had found on the Tamarind tree growing adjacent to our house. I watched mesmerized as the bird, oblivious to my presence, devoured the caterpillar, and almost immediately found another amongst the leaves of the branch it was on. As I gawked at it from a distance, another bird with a long, flowing white tail pounced on it and tried to flee with the juicy catch. The tug-of-war between the two went on for a good thirty minutes, before they abruptly ended their fight and moved to another tree. I was hooked to birding for life since that morning!

That was seven years ago, and such encounters were getting common around our newly built house into which we had just moved. The house stood surrounded by tall trees and

dense foliage. There was a tangle of trees, weeds, and underbrush all around us. My search online for information revealed that the two birds I had seen were Indian Golden Oriole and a male Indian Paradise-flycatcher. Back then, I remember waking up to noisy bird calls and the chatter of Pied Starling mixed with Common Myna and Rosy Starling, and once again in the evenings when they gathered on the Jackfruit tree right outside my bedroom window. Greater Coucal, with its typical deep resonant call, foraging in our garden early in the morning was a common sight, and is so even now. As is the Asian Koel, feeding on ripe papaya fruit. Also present in the garden, feeding on the seeds of the Tulsi planted by my Mother, are Ashy and Plain prinias and the Scaly-bellied Munia. During their nesting season, I have observed Scaly-bellied Munia plucking the long Lemongrass leaves from our garden to build their nests. We regularly sight Black-naped



Grey-headed Canary-Flycatcher



Banded Bay Cuckoo

Monarch and Indian Paradise-flycatcher on one tree in the backyard, and Tickell's Blue-flycatcher announces daybreak with its continuous singing every morning from our windowsills.

The Jackfruit tree is a favourite of the Indian Paradise-flycatcher, which usually drops by in the quiet afternoons and wakes us up with its shrill, sharp, incessant calls. Another regular afternoon visitor is a group of Jungle Babblers that can be heard before they are seen. Almost always in a group of around eight to twelve, they forage noisily amongst the banana trees, searching for grubs hidden amongst its fleshy bark. And so is the White-breasted Waterhen that can be seen foraging amongst the thick shrubs; its calls can be heard late into the night, especially during monsoons, which is its breeding season.

Parakeets visit our neighbour's Lady's Fingers crop to feast on the seeds the mature seed pods. The Moringa (or Drumstick) tree growing nearby is the favourite hunting ground of Purple-rumped Sunbird, Pale-billed Flowerpecker, and Indian Golden Oriole, which regularly feed on the tiny caterpillars found on the tender leaves of the tree. You may catch the sight of a White-throated Kingfisher sitting quietly on the mango tree looking out for scorpions or grasshoppers.



Black-naped Monarch





Shikra



Tickell's Blue-flycatcher

Weekdays being busy, the early mornings and weekends were the only time I got to explore the birdlife. Many of my encounters with these winged beauties have been pleasant surprises or chance happenings. I remember one incident some four years back when I was bedridden with fever for three days. On the fourth day, I felt better so I decided to take a walk on our terrace. As usual, my eyes were searching for bird movements on the trees adjoining the terrace. I saw a sunbird pair feasting on ants on the mango tree, so I excitedly ran down and got my camera.



Jungle Babbler

While I was trying to get a perfect frame for the shot, I noticed a Shikra feasting on an Oriental Garden Lizard. The Shikra noticed my presence but continued with its meal, keeping a watchful eye on me; I watched it quietly finish off its meal before flying away.

It was sheer exuberance that I felt when I spotted the extremely secretive Orange-headed Thrush in our backyard some two years back around December. I was out photographing some birds, when the thrush flew up and landed in dense bushes some distance ahead of me. I managed to get a couple of record shots of this orange beauty. Last year, around November, was another such momentous time. On a quiet Sunday afternoon, as I sat reading a newspaper on the terrace, I noticed some movement on top of the Moringa tree in front of me. Immediately, I fetched my camera and took some shots of the bird. Looking at the markings and colour, I assumed it was a Eurasian Wryneck, a migratory bird which gets its English name from its ability to turn its head through almost 180 degrees. If it was a Wryneck, this would be a new addition to my backyard bird list. But the markings and colour of this bird had me confused, so I sent the picture to a senior birder friend for confirmation. He wrote back to say that it wasn't a wryneck,



Coppersmith Barbet



Greater Coucal

but a Banded Bay Cuckoo, a species of small cuckoo found in the Indian subcontinent. These are mostly found in well-wooded forests, mainly in hill areas; insects are their primary diet.

The latest addition to the list has been the Oriental Honey-buzzard seen in November, 2021. I was in our backyard doing some chores when I saw a large raptor sitting far away on a treetop. I fetched my binoculars and took a look, but could not identify it due to the harsh sunlight. I decided to take a closer look from my neighbour's terrace, which was nearer to where the bird sat. Camera and binoculars in hand I reached there, only to find that the bird had flown off. Disappointed, I returned home and just as I was entering the gate I casually looked up and saw that the raptor was perched on a coconut tree adjacent to my house. That's how nature works, surprises!

When I began photography, all I owned was a small Canon point and shoot with 12x digital zoom. Interactions with fellow birders shifted my focus and I slowly began documenting the birds I saw in and around my garden and backyard in detail. I also managed to get decent photographs when I graduated to a DSLR and a good birding lens (Nikon D7000 and the versatile Nikon 80–400 VR-II). The latest addition to the

equipment is the excellent Nikon 200–500 mm VR lens and D500 body. I also got myself a good pair of binoculars to observe the birds and their behaviour more closely. These are of immense help in identifying birds and observing them from a good distance, thus not disturbing them. It was a great treat to watch them forage, preen, feed their young, defend their territory from predators, and go about their normal routine undisturbed.

Once I wondered how many species of birds visit my backyard. So I sat down and made a list of the birds that I had sighted in and around my garden and backyard. I was pleasantly surprised when the list crossed the fifty mark. With the additions in sightings in subsequent years, the list kept growing and has now reached sixty-two. Who says that national parks are the only place one can discover wildlife? I consider myself blessed to be a witness to such beauty at my doorstep. 🐦



**Leonard Rebello** is a Mechanical Design Engineer by profession. Birding is an obsession and wildlife photography is a serious hobby for him.





# Changing Environmental Policies

Text: Neha Sinha

*The past few months have been a time of rapid changes in environmental policy. The government has proposed several major amendments in environmental legislation. Late last year, the government introduced two bills in Parliament with no public or expert consultation. The first bill proposed changes to the Biological Diversity Act of 2002 that regulates the use of biological resources, and their access and benefits. The second bill proposed changes to the Wild Life (Protection) Act (WLPA) of 1972 that protects wild animals and plants from poaching, trade, or other threats. Another new proposal is the Lakshadweep Development Authority Regulation, 2021, the draft of which has been sent for public comment.*

## Biological Diversity Amendment, 2021

The primary purpose of the Biological Diversity Act, 2002 is to conserve biodiversity and to recognise the rights of communities, who are custodians of this biodiversity. In a country as diverse as India, there are at least two challenges to this. Firstly, who gets access to biological diversity? This could, for example, have far reaching effects on commercially exploitable taxa

like orchids or medicinal plants. Secondly, who gets the benefits of biological diversity? As per the 2002 Act, benefits need to be shared with local communities. The issue of benefit is also important on an international stage. As it stands, if any party, whether Indian or foreign, decides to prospect for biological resources, they must take permission from the National Biodiversity Authority, set up under the 2002 Act.

There have been several concerns raised against the new amendment as it makes the 2002 Act less equitable, curtails the ambit of those who receive benefits, and reduces the power of biodiversity committees. The Bill dilutes the current framework which is in line with the Nagoya Protocol (an international agreement on sharing of benefits from access to biological resources under the United Nations led Convention on Biological Diversity, of which India is a signatory). BNHS has sent its concerns to the Government on the proposed changes to the Biological Diversity Act after consulting experts, other NGOs, BNHS staff, and lawyers. We were invited to depose in front of the Joint Parliamentary Committee in February, 2022 on this issue.

The proposed amendment suggests the following change for Section 7:

“Provided that the provisions of this section shall not apply to the codified traditional knowledge, cultivated medicinal plants and its products, local people and communities of the area, including growers and cultivators of biodiversity, vaid, hakims, and registered AYUSH practitioners, who have been practicing indigenous medicines, including Indian systems of medicine for sustenance and livelihood.”

Section 7 applies to the necessity of intimating the State Biodiversity Board (SBB), and giving prior information before using biological resources. Read along with Section 24 and 23 of the Act, it gives SBB the power of enquiry over the party. It also means that the SBB is aware of how much of the resource is being taken. If this section does not apply to “codified traditional knowledge”, then the SBB will remain in the dark regarding use of biological resources. Further, no regulations and adjustments could then be suggested towards the sustenance of the biological resource.

The proposed amendment seeks to exempt registered AYUSH practitioners from intimating the SBB. We stressed that such practitioners may also be representing larger corporations or bodies, and should not be exempt from Section 7 and from intimating the SBB. It is further submitted that no definition of use of biological resources for “sustenance and livelihood”

has been given. In the absence of a definition, sustenance and livelihood may also refer to large-scale use of biological resources. It is important that “sustenance and livelihood” be defined by this Act.

It is practically impossible to differentiate between medicinal plants grown in the wild and cultivated medicinal plants. Thus, there is a danger that wild medicinal plants may be overharvested and passed off as cultivated plants. Certainly, medicinal plants should be cultivated, but not at the cost of trafficking of wild plants. ‘Growers and cultivators of biodiversity’ already covers medicinal plants. Thus, it is suggested that a different system to cultivate medicinal plants be worked out in consultation with the SBB if it is felt to be necessary, and the proposed exemption regarding intimation of the use of cultivated medicinal plants under Section 7 be removed.

Regarding the definition of “benefit claimer”, BNHS has suggested that benefit claimers should include those who use codified traditional knowledge. The new proposed definition suggests “benefit claimers” mean the conservers of biological resources, their by-products, creators and/or holders of associated traditional knowledge thereto (excluding codified traditional



Wildlife Schedules in the proposed Wild Life (Protection) Act do not include all taxa found in India and require wider consultation with experts



knowledge) and information relating to the use of such biological resources, innovations and practices associated with such use and application.

BNHS has stressed that “codified traditional knowledge” can refer to any knowledge that is written in books, papers, among others. Thus, codified traditional knowledge can be Ayurveda, Unani, Siddha, etc. It is important to note that farmers, tribals, and fisherfolk may also be using codified traditional knowledge. They should be involved in the ambit of benefit claimers as per the principles of Access and Benefit Sharing, enshrined in the principal Act and the Nagoya Protocol. One of the purposes of the Biodiversity Act is to provide equitable sharing of benefits. This is a pillar of the Convention of Biological Diversity (CBD) and the Nagoya Protocol under the CBD.

The 2002 Act required prior approval from the National Biodiversity Authority to access biological resources for certain categories of people / corporate bodies, which included people who are not citizens of India and bodies which are not registered or incorporated in India. But the amendment restricts this to “foreign-controlled company” that is incorporated outside India, which means that no company which is incorporated or registered in India is required to take the approval of the National Biodiversity Authority.

The 2002 Act called for a three-tier structure consisting of a National Biodiversity Authority at the national level, State Biodiversity Boards at the state level, and Biodiversity Management Committees at the local body levels. The primary responsibility of the Biodiversity Management Committees is to document the local biodiversity and associated knowledge in the form of a People’s Biodiversity Register. But the amendment bill seeks to comprehensively dilute the power of these committees. Also, the Act had cognizable and non-bailable offences under which penal action could be taken, but now these have been removed and offenders can be let off with just a financial penalty.

**Wild Life (Protection) Act – Amendment 2021**

The WLPA 1972 has been amended several times in its 50-year history, but the current proposed amendment is likely the most expansive

so far in scope. It covers areas of legislation ranging from trade in wild species, controlling the spread of invasive species, to permitting filmmaking in protected areas, among others. Most of us believe that the proposed amendments will remove protection for scores of animal, bird, plant, and insect species, and endanger others. We have sent our concerns on the proposed amendments to the Act to the Environment Ministry, Parliamentary Standing Committee, after consulting experts, other NGOs, BNHS scientists, and lawyers. BNHS was also asked to depose to the Parliamentary Standing Committee. The issues of the proposed amendment are:

Firstly, the Schedules in the Bill are not comprehensive. Several Critically Endangered birds have been left out of Schedule I. There are other species that do not figure in the Schedules or have been missed. Birds listed as Critically Endangered in the IUCN Red List should get the highest protection under the WLPA, as they need absolute protection from hunting, killing, poisoning, disturbances to breeding birds, and loss / degradation of habitat, among others. For example, several Critically Endangered birds like Baer’s Pochard, Sociable Lapwing, Yellow-breasted Bunting, and Spoon-billed Sandpiper are listed in Schedule II, not Schedule I of the 2021 Act. Some other Critically Endangered and Endangered birds occurring in India like Masked Finfoot,

**BNHS’s concerns with the Bill**

1. In their present form, the Schedules of WLPA 2021 need change on two counts: a) Not all species are included, and b) Critically Endangered species in Schedules II, III and IV should be shifted to Schedule I.
2. There are several errors in the common and scientific names of species, these should be corrected.
3. The inclusion of Invasive Alien Species in the Act is welcome, but the definition is incomplete and should be changed.
4. State Wildlife Boards should be retained as per the WLPA 1972.
5. Declaration of vermin is excessive.
6. Ownership and transport of captive elephants should not be encouraged.



PHOTOGRAPH BY DHIRAJ KUMAR

The Bill relaxes the provisions of transporting elephants, which is likely to encourage illegal trade in wild elephants

Barau’s Petrel, Swamp Grass-babbler (Swamp Prinia), Banasura Chilappan, Nilgiri Chilappan, Dark-rumped Swift, and Grey-crowned Prinia are missing in the proposed WLPA 2021.

BNHS thus recommends that the Schedules of the WLPA 2021 be opened up for wide consultation with biologists and experts on both flora and fauna, to ensure that the Schedules are applied or rationalised appropriately and that all Indian wild animals are included.

Secondly, the earlier four Schedules have been condensed to two. The bill empowers the government to declare any species of Schedule II as ‘vermin’ (pest). Several threatened species are now placed in Schedule II. It is incumbent on the Government to declare vermin only in rare cases, as the principal purpose of the WLPA is to protect wildlife. The declaration of vermin should be a science-supported decision arising from baseline studies of wildlife populations, abundance, and distribution. BNHS is of the view that Clause 38, which relates to declaration of certain wild animals to be vermin, is excessive and should be removed.

Thirdly, the bill has a valuable addition on invasive species, which are a serious threat to

wildlife today. BNHS welcomes this addition, but has suggested a more inclusive definition of invasive species. However, the Bill defines invasive alien species as follows:

“Invasive alien species” means a species of animal or plant which is not native to India and whose introduction or spread may threaten or adversely impact wildlife or its habitat. However, several wild animals native to India (such as the Common Crow) may be invasives in other parts of India (such as in Andaman and Nicobar Islands). The Convention on Biological Diversity defines invasive alien species as follows:

Invasive alien species are plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health. In particular, they impact adversely upon biodiversity, including decline or elimination of native species – through competition, predation, or transmission of pathogens – and the disruption of local ecosystems and ecosystem functions. Further, domestic animals like dogs and cats also behave like invasive alien species.





DHIRTIMAN MUKHERJEE

Coral reefs are unique marine habitats in supporting the world's most diverse marine life

BNHS thus recommends the following definition of invasive alien species:

“Invasive alien species” means a species of animal, including domestic dogs and cats, or plant which is not native to an ecosystem and whose introduction or spread may threaten or adversely impact wildlife or its habitat.

Fourthly, the Bill moots a reduction in the role of State Wildlife Boards – bodies which are crucial in determining the fate of large projects involving forests or protected areas in states – and BNHS has strongly opposed this.

Lastly, the Bill relaxes the provisions of transporting elephants; this is likely to encourage illegal trade in wild elephants and BNHS has suggested that the relevant clause be dropped.

#### Draft Lakshadweep Development Authority Regulation, 2021

Government of India had introduced the Draft Lakshadweep Development Authority Regulation, 2021 for public comment. This regulation will clear the way for land-use in the coral atolls of Lakshadweep and also envisages taking over of any privately held land on the islands for creating infrastructure. A BNHS representation was sent to the President of India. A larger, longer review has also been initiated

with a diverse group of scientists on the issue – the Lakshadweep Research Collective.

We emphasized that in our considered opinion, the framing of “development” in the Act does not adopt an integrated approach (as mandated by the orders of the Supreme Court and the recommendations of the Court-appointed Justice Raveendran Committee on the same), and neither does it take a sustainable development approach (as agreed under our commitments to the Convention on Biological Diversity). It also takes a concretized view of development, in which “development” is limited to construction, rather than an integrated process combining both built and natural systems. Any development plan for Lakshadweep must take into account the unique ecological dimensions of the area, the threat of climate change, the carrying capacity of the islands, and the participation of the local people. ➡



**Neha Sinha** heads Conservation and Policy at BNHS, and is the author of *WILD AND WILFUL – TALES OF 15 ICONIC INDIAN SPECIES*



#### Dragonflies & Damselflies in & around Delhi: A Field Guide

Author: Nazneen Siddique

Published by: WWF-India and DK-India, New Delhi, 2019

Size: 21.5 x 12.5 cm

Pages: Pp. 144

Price: 399/- (INR)

Paperback

Reviewed by: **Asad R. Rahmani**

I am amazed by the number of natural history books published in the United Kingdom. There are multiple books on every taxon (butterflies, beetles, frogs, lizards, acorns, fungi, trees, shrubs, grasses) from every region, even villages and towns (e.g., *BIRDS OF CAMBRIDGE*, *BRITISH MUSHROOMS & TOADSTOOLS*), and nature reserves. Writing, illustrating, photographing, editing, printing, and distribution is a full-fledged industry in UK. There are book shops that sell only natural history books, bird houses, bird/animal feeds and products. We are far behind them in this field, but are catching up. I am happy that young people are taking to writing and photographing the so-called lesser species. Isaac Kehimkar's book on the *BUTTERFLIES OF INDIA*, Dr V. Shubhalaxmi's book on *MOTHS OF INDIA*, and Aniruddha Dhamorikar's book on *INSECTS & SPIDERS OF KANHA TIGER RESERVE* are a few such examples. To this, Nazneen has added *DRAGONFLIES & DAMSELFLIES IN & AROUND DELHI: A FIELD GUIDE*. My

congratulations first, to DK-Penguin Random House and WWF-India for printing and distribution of this handy pocket guide, and secondly to the author, a homemaker, for working on this neglected taxon of India.

As the blurb says “This Field Guide is a handy tool for nature enthusiasts to learn, identify, and appreciate these beautiful insects. It will expand their knowledge of the various dragonflies and damselflies species in the region, their characteristics, habitats, and the conservation initiatives required.” As a conservationist, my emphasis is on the last three words “conservation initiatives required”.

Dragonflies and damselflies (or odonates) are among the finest indicators of a healthy environment, particularly water, as a large part of their life-cycle is spent in clean water, not the dirty polluted water that we see everywhere in and around Delhi. If odonates are present, it means there is clean water in the vicinity where their immature stages, or nymphs, have lived, from a few months to a year, before they transformed into adults. In both the nymphal and adult stages, most dragonflies and damselflies are carnivorous. Adult dragonflies are major predators of many insects, which is why they are called ‘tigers of the insect world’. Like tigers, dragonflies and damselflies are highly territorial and can be seen chasing each other. Like any predator, they ambush and chase their prey. Odonate nymphs and adults feed on mosquitos and other insects. Mosquito larvae live in water where odonate nymphs eat them, and when mosquitoes emerge as adults, they are preyed upon by adult dragonflies.

To a mechanical engineer, an odonate is a perfect flying machine – nothing comparable and more energy efficient has yet been made by human beings. Another remarkable feature of these insects is their compound eyes. They have unparalleled vision in the animal world. They use 11–30 colours to see the world in ultra-colour, including ultra violet and polarized light. Many laboratories in the world are studying the eyes of odonates to mimic them to make new optical instruments.

This book describes 42 species found in Delhi-NCR, and is profusely illustrated. As odonates show sexual dimorphism, both the male and female of the various species are illustrated in their typical posture. Common name, scientific name, size, behaviour, habitat, habit, and distribution are described. In some species, interesting snippets are added as a box item.

The size, design, and get-up of the book are admirable. I hope more such books are brought out by DK-India and WWF-India on different taxa. Like dragonflies and damselflies, this book is also remarkable. 📖



## Winter Raptor Survey



Egyptian Vulture, a common sight at Asola Bhatti

Raptors play an important ecological role by controlling populations of rodents and other small mammals. Migration, summer nesting, and wintering make up much of the annual lifecycle of raptors. Observing these predators during each of these phases provides crucial insights into their conservation status and needs.

BNHS-CEC-Delhi has been organizing a Winter Raptor Survey at Asola Bhatti Wildlife Sanctuary, in collaboration with the Department of Forests & Wildlife GNCT of Delhi, since October 2017. The goal of this citizen science programme is to estimate, based on large numbers of observations, the population of birds of prey migrating to the Sanctuary in winter.

Almost every Sunday during winter, since onset of the programme, a motley group of beginners and experts, old and young, gather to count birds of prey. In 2022, between January and March, 130 participants conducted eight surveys and recorded the presence of Critically Endangered Red-headed Vulture, Endangered Egyptian Vulture and Steppe Eagle, and Vulnerable Greater Spotted Eagle and Indian Spotted Eagle. Among the 21 species recorded, eight are resident species, eight are migrants, one is a vagrant,

and the status of four species could not be ascertained. In February 2022, we recorded Northern Goshawk, a new addition to the list of Delhi's avifauna. In December 2021, Black Eagle, a rarity in Delhi, was recorded, and since then, the species has been regularly sighted by us.

Connecting volunteers with wildlife programmes like these helps in cultivating ownership for green areas in our city, and in raising public awareness regarding these majestic birds. Countless cultures have revered birds of prey as representatives of the strength, freedom, and power of nature. Today, however, their ability to survive is threatened. Such programmes are a step towards ensuring that raptors survive and thrive in their habitats, to maintain an environment that sustains humans and wildlife alike.

If you would like to participate in such programmes, please contact: <cecbnhsdelhi@bnhs.org>

## Future Army Officers visit BNHS



CME cadets with Mr Rahul Khot and Capt. Mandar Salaye at Hornbill House

On March 10, 2022, 37 Gentlemen Cadets from the Cadets Training Wing, College of Military Engineering (CME), Pune, visited BNHS to get familiarised with issues of environment conservation, wildlife preservation, and climate change. The CME curriculum includes training of Combat Engineers, Military Engineering Service, Border Roads Engineering Services and Survey. Mr Bittu Sahgal, President, BNHS, Dr Bivash Pandav, Director, and Dr Parvish Pandya, Life Member, interacted with the cadets during the visit. The cadets also visited the Collections and Library; Mr Rahul Khot, Assistant Director (Collections), and Ms Nirmala Barure, Librarian, showcased the specimens and books in the Collections and Library, and briefed the cadets on the functioning, upkeep, and digitization programme of their departments.

Published on April 15, 2022, by the Honorary Secretary for Bombay Natural History Society, Hornbill House, Dr Sálím Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400 001, Maharashtra, India.



## Online-cum-field Courses for Amateurs

Courses to be conducted by BNHS-CEC Mumbai in 2022–23:

1. Course name: **Leadership Course in Biodiversity Conservation**  
**Duration:** 11 months (June 2022–April 2023)  
**contact:** biodiversity@bnhs.org
2. Course name: **Basic Course in Herpetology**  
**Duration:** 4 months (June 2022–September 2022)  
**contact:** herpetology@bnhs.org
3. Course name: **Field Course in Botany**  
**Duration:** 6 months (July 2022–December 2022)  
**contact:** botany@bnhs.org
4. Course name: **Basic Course in Ornithology**  
**Duration:** 11 months (August 2022–June 2023)  
**contact:** ornithology@bnhs.org
5. Course name: **Basic Course in Butterfly Studies**  
**Duration:** 6 months (August 2022–January 2023)  
**contact:** butterfly@bnhs.org

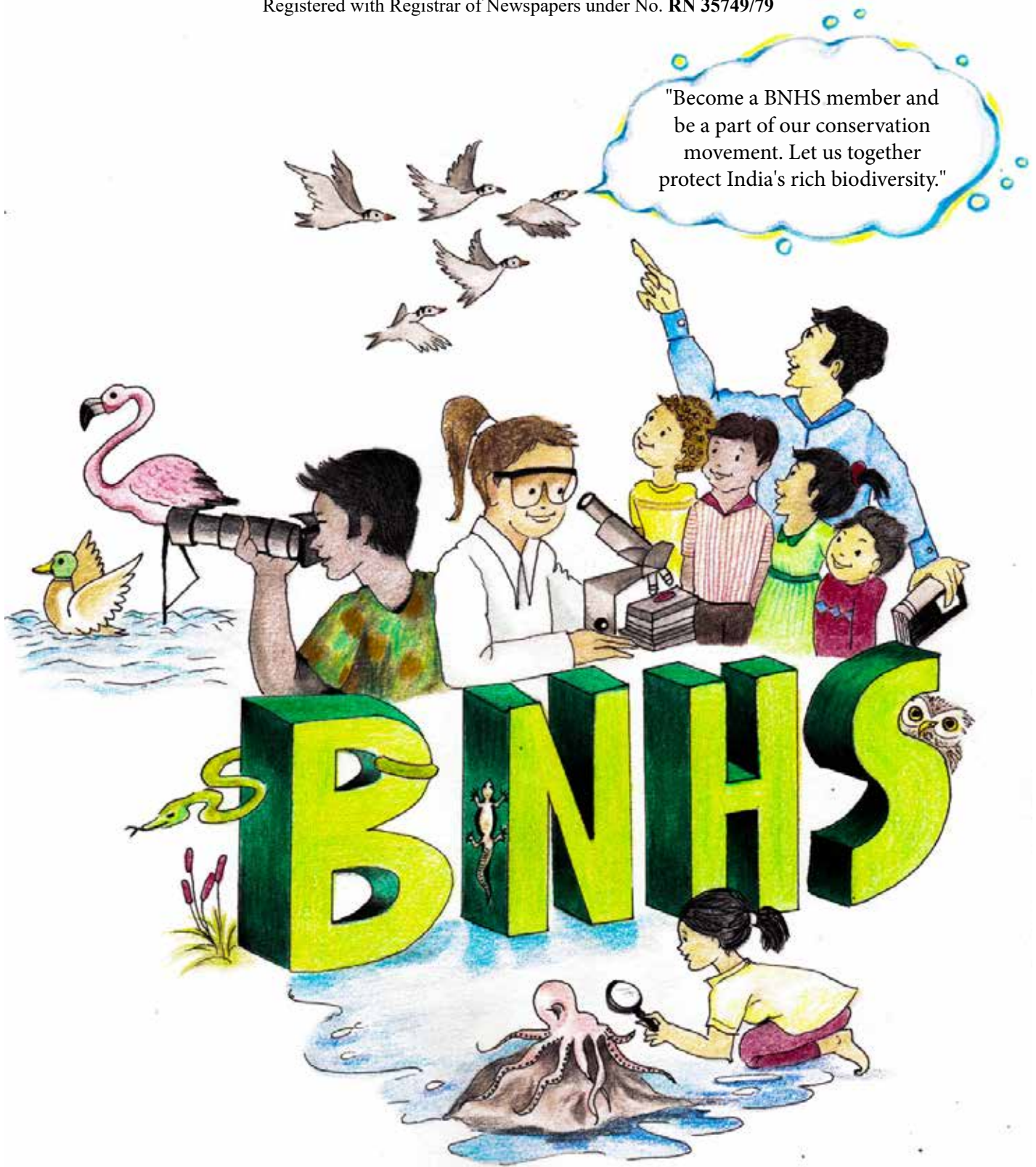
Kindly refer this link to download the course brochure:  
[https://www.bnhs.org/news\\_listing](https://www.bnhs.org/news_listing)

- ☞ All courses include study material, interactions with the subject through one day field visits, 3–4 day field camps\* (in India), and online webinars
- ☞ Qualification required for all courses: Matriculation
- ☞ Study Material and Medium of Instruction: English



For registration and further queries, write to us at the email id given above or call us on +918591315589 / +919594953425/+919594929107 (Monday to Friday 10:00 a.m. to 5:30 p.m.)





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protect India's rich biodiversity."



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